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ABSTRACT

This activity guide, developed to provide hands-on environmental education activities geared to Kerr Lake State Recreation Area in North Carolina, is targeted for grades 3, 4, and 5 and meets curriculum objectives of the standard course of study established by the North Carolina Department of Public Instruction. Three types of activities are included: pre-visit, on-site, and post-visit. The on-site activity is conducted at the park, while pre- and post-visit activities are designed for the classroom. Major concepts included are: natural decomposition, environmental stewardship, recycling importance, recycling feasibility, conservation, and biodegradability. Includes an introduction to environmental stewardship, a vocabulary list, scheduling worksheet, parental permission form, North Carolina Parks and Recreation program evaluation, and information about Kerr Lake State Recreation Area. (MKR)

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ENVIRONMENTAL

STEWARDSHIP

IT'S ONLY NATURAL

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Kerr Lake State Recreation Area

An Environmental Education Learning Experience

Designed for Grades 3-5

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ENVIRONMENTAL

STEWARDSHIP

IT'S ONLY NATURAL

Kerr Lake State Recreation Area

An Environmental Education Learning Experience

Designed for Grades 3-5

"Unless we find a way to dramatically change our civilization and our way of thinking about the relationship between humankind and the earth, our children will inherit a wasteland."

- Albert Gore, Jr.,
Earth In the Balance

Funding for this publication was generously provided by

CP&L

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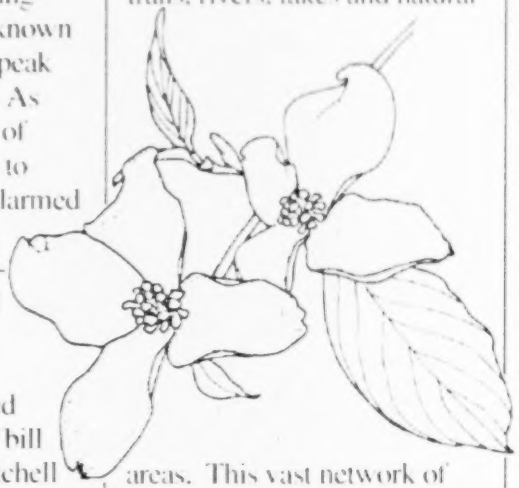
Introduction to the North Carolina State Parks System

Preserving and protecting North Carolina's natural resources is actually a relatively new idea. The seeds of the conservation movement were planted early in the 20th century when citizens were alerted to the devastation of Mount Mitchell. Logging was destroying a well-known landmark - the highest peak east of the Mississippi. As the magnificent forests of this mile-high peak fell to the lumbermen's axe, alarmed citizens began to voice their objections. Governor Locke Craig joined them in their efforts to save Mount Mitchell. Together they convinced the legislature to pass a bill establishing Mount Mitchell as the first state park of North Carolina. That was in 1915.

The North Carolina State Parks System has now been established for more than three quarters of a century. What started out as one small plot of public land has grown into 59 properties across the state, including parks, recreation areas, trails, rivers, lakes and natural areas. This vast network of land boasts some of the most beautiful scenery in the world and offers endless recreation opportunities. But our state parks system offers much more than scenery and recreation. Our lands and waters contain unique and valuable archaeological, geological and biological resources that are important parts of our natural heritage.



As one of North Carolina's principal conservation agencies, the Division of Parks and Recreation is responsible for the more than 125,000 acres that make up our state parks system. The Division manages these resources for the safe enjoyment of the public and protects and preserves them as a part of the heritage we will pass on to generations to come.

An important component of our stewardship of these lands is education. Through our interpretation and environmental education services, the Division of Parks and Recreation strives to offer enlightening programs which lead to an understanding and appreciation of our natural resources. The goal of our environmental education program is to generate an awareness in all individuals which cultivates responsible stewardship of the earth.

For more information contact:

N.C. Division of Parks and Recreation
P.O. Box 27687
Raleigh, NC 27611-7687
919/ 733-4181

Introduction to Kerr Lake State Recreation Area

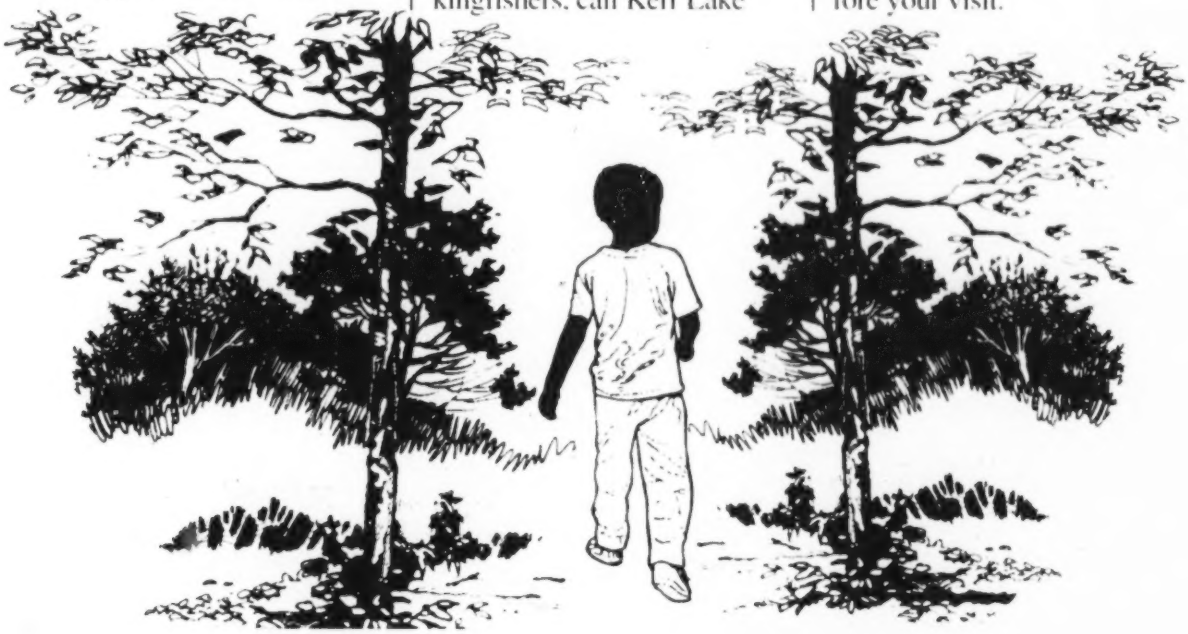
Kerr Dam and Reservoir were created by the U.S. Army Corps of Engineers to provide hydroelectric power and flood control in the Roanoke River basin. Construction began in 1946 and, following seven years of construction, was completed in 1953. The project was named for North Carolina Congressman John H. Kerr, who was instrumental in its development. When the reservoir was created, 50,000 acres were flooded–covering lands that were once home to the Native American tribe known as the Occoneechee. Today, besides electricity and flood control, Kerr Lake State Recreation Area provides fish and wildlife conservation and forest management as well as recreation, with over 800 miles of shoreline offering innumerable opportunities to observe and learn about nature.

Kerr Lake is a mecca for those who enjoy swimming, fishing, camping and boating. In 1993, nearly 1.25 million people visited Kerr Lake–over 235,000 in July alone. Each recreation area on the lake has one or more concrete boat ramps and Satterwhite and Steele Creek marinas offer year-round mooring, slips, service and supplies. Over 800 tent and trailer campsites are available for campers, while picnickers can choose from more than 300 picnic tables and 14 shelters. Hiking and nature trails are also available.

In addition to recreational opportunities, Kerr Lake and the surrounding forest provide habitat for a myriad of wildlife. Waterfowl, including ducks, great blue herons and kingfishers, call Kerr Lake home. Below the water's surface, many varieties of fish, including bass, bluegill and crappie can be found. Along the shoreline, deer, opossum and fox are common. Kerr Lake offers opportunities to learn, explore and just have fun.

Groups are encouraged to visit the park during all seasons of the year for recreation, exploration and environmental education programs and activities. Group leaders may choose to design and conduct their own activities or request the help of park staff. Park staff will be glad to assist you with your programming needs.

Every effort will be made to accommodate persons with disabilities. To make arrangements, please contact the park office at least two weeks before your visit.



Scheduling a Trip:

1. To make a reservation, contact the park at least two weeks in advance.

2. Complete the Scheduling Worksheet, located on page 8.1, and return it to the park as soon as possible.

3. Research activity permits may be required for sampling activities. If your group plans to collect any plant, animal or mineral within the park, please contact the park office at least 30 days in advance to obtain a permit application.

Before the Trip:

1. Complete the pre-visit activity in the Environmental Education Learning Experience packet.

2. The group leader should visit the park without the participants prior to the group trip. This will enable you to become familiar with the facilities, park staff, identify themes and work out any potential problems.

3. The group leader should discuss park rules and behavior expectations with adult leaders and participants. Safety should be stressed.

4. Activities that take place outdoors may expose participants to insects and seasonal weather conditions. Be prepared by dressing accordingly and wearing sunscreen or insect repellent, if necessary. Comfortable walking shoes should also be worn.

5. *The group leader is responsible for obtaining a parental permission form from each participant, including a list of any health considerations and medical needs.* An example of this form is on page 8.2.

6. *If you will be late or need to cancel your trip, please notify the park as far ahead as possible.*

While at the Park:

Please obey the following rules:

1. To help you get the most out of the experience and increase the chance of observing wildlife, be as quiet as possible while in the park.

2. On hikes, walk behind the leader at all times. Running is not permitted.

3. All plants and animals within the park are protected. Breaking plants and harming animals are prohibited in all state parks. This allows future visitors the same opportunity to enjoy our natural resources.

4. Help keep the park clean and natural; do not litter. If you find litter left by others, please pick it up.

5. In case of accident or emergency, contact park staff immediately.

Following the Trip:

1. Complete the post-visit activity in the Environmental Education Learning Experience packet.

2. Build upon the field experience and encourage participants to seek answers to questions and problems encountered at the park.

3. Relate the experience to classroom activities and curriculum through reports, projects, demonstrations, displays and presentations. Ask park staff for additional ideas.

4. Give tests or evaluations, if appropriate, to determine if the students have gained the desired information from the experience.

5. File a written evaluation of the experience with the park. An evaluation form is available on page 8.3.

Park Information:

Kerr Lake State
Recreation Area
Rt. 3, Box 800
Henderson, NC 27536
Tel. (919) 438-7791
Fax (919) 438-7582

Office Hours:

Year-round 8:00 am - 5:00 pm

Hours of Operation:

Nov-Feb	8:00 am - 6:00 pm
Mar,Oct	8:00 am - 7:00 pm
Apr,May,Sep	8:00 am - 8:00 pm
Jun-Aug	8:00 am - 9:00 pm

Introduction to the Activity Packet for Kerr Lake State Recreation Area

The Environmental Education Learning Experience, *Environmental Stewardship– It's Only Natural*, was developed to provide environmental education through a series of hands-on activities geared to Kerr Lake State Recreation Area. The activity packet, designed to be implemented in grades 3-5, meets curriculum objectives of the standard course of study established by the North Carolina Department of Public Instruction. It includes three types of activities:

1) pre-visit activity
2) on-site activities
3) post-visit activity

The on-site activities will be conducted at the park, while pre-visit and post-visit activities are designed for the classroom. These activities may be performed independently or in a series to build upon students' newly gained knowledge and experiences.

The Environmental Education Learning Experience, *Environmental Stewardship– It's Only Natural*, will expose students to the following major concepts:

- **Natural decomposition**
- **Environmental stewardship**
- **Recycling importance**
- **Recycling feasibility**
- **Conservation**
- **Biodegradability**

The first occurrence of a vocabulary word used in these activities is indicated in **bold type**. Definitions are listed in the back of the activity packet. A list of the reference materials used in developing the activities follows the vocabulary list.

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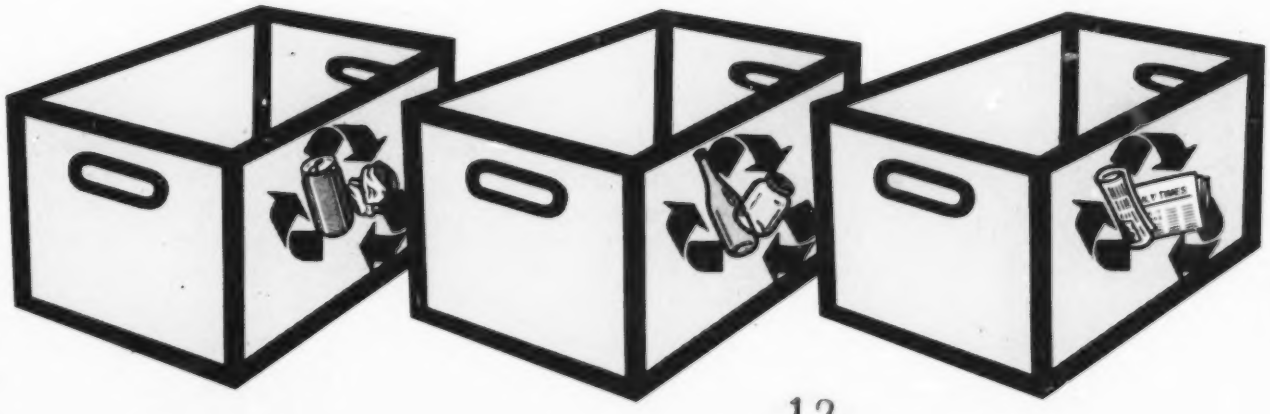
NOTE:
On-site activities may require hiking which could expose the students to hot, humid conditions and ticks. Accessibility to some of these areas may be difficult for persons with special needs.



Introduction to Environmental Stewardship at Kerr Lake State Recreation Area

Environmental stewardship is a long name for taking care of the earth. Some of the ways we can practice environmental stewardship include being responsible in what we use, i.e., only buying foods that are locally grown and in season (reducing unnecessary use of transportation fuel); only driving when necessary, keeping vehicles properly maintained to reduce their **pollution**; using low-flow toilets and shower heads; not **littering**, picking up other people's litter; using **biodegradable** products.

The environmental practices emphasized in this packet are:

- reducing waste
- reusing items through alternative uses
- recycling whenever possible.

Most of these practices can also be found in nature.

Nature reduces, **reuses** and **recycles**. Trees do not come with excess packaging–every part of the tree contributes to its survival. Dead trees are reused as perches, insect and animal homes and nesting cavities. Eventually, those same trees will be recycled (as they **decay** and **decompose**) back to the earth and provide nutrients for the next generation of trees and plants.

The principle of environmental stewardship and the practices of reducing, reusing and recycling are important to all of us in our daily lives. They are extremely important to the North Carolina Division of Parks and Recreation because the **environment** is our primary concern.

Each year, Kerr Lake State Recreation Area has approximately 1.5 million visitors within an area of approximately 3,000 acres. The problems of **litter** and **waste** disposal at the park are comparable to those of a city. Unlike a city, however, Kerr Lake State Recreation Area, like all North Carolina Parks and Recreation Areas, is dedicated to **preservation** and **conservation** of all the environment. Kerr Lake State Recreation Area's Environmental Education Learning Experience, *Environmental Stewardship: It's Only Natural*, is designed to introduce students to the importance of environmental stewardship at Kerr Lake and elsewhere.

Activity Summary

The following outline provides a brief summary of each activity, the major concepts introduced and the objectives met by completion of the activity.

I. Pre-Visit Activity

#1 Natural Recycling (page 3.1.1)

In this activity, students will construct a working compost pile in order to understand the benefits of natural decomposition.

Major Concepts:

- Decomposition
- Organic waste
- Compost
- Environmental stewardship

Objectives:

- Name two benefits of making a compost pile.
- Name four elements of a compost pile.
- State how long a compost pile will take to start working.
- Explain how nature recycles.

II. On-Site Activities

#1 Trash Trek (page 4.2.1)

The students will take a hike at Kerr Lake State Recreational Area to see first-hand how nature recycles and see examples of good and poor earth stewardship by humans.

Major Concepts:

- Recycling
- Environmental stewardship
- Regeneration

Objectives:

- Identify two signs of forest regeneration.
- Recognize five items of human-made refuse and determine if each can be recycled.
- List two agencies which work with forest regeneration projects.

#2 **Recycling Relay** (page 4.2.1)

The students will run a relay to separate recyclable materials from household trash. They will learn how to properly dispose of these waste products.

Major Concepts:

- Recycling
- Recyclable trash
- Environmental stewardship

Objectives:

- Explain three ways recycling helps our natural world.
- Identify four types of commonly recyclable material.

III. Post-Visit Activity

#1 **Don't Throw It All Away** (page 5.2.1)

The students will begin a recycling program within their school, and increase community awareness about recycling through promoting its use and availability.

Major Concepts:

- Recycling
- Recycled products
- Enviromental stewardship

Objectives:

- Promote recycling of at least three different types of recyclable items.
- Name four items of trash that can be recycled, and at least one product each one might be turned into when recycled.
- Explain three reasons why recycling is important.

Pre-Visit Activity #1 — Natural Recycling

Curriculum Objectives:

Grade 3
- Communication Skills: listening and viewing comprehension
- Science: interdependence of plants and animals, difference between living and non-living things, soil
- Social Studies: have a sense of time and chronology, participate in group activities

Grade 4
- Communication Skills: listening, viewing, reading and vocabulary comprehension
- Science: interdependence of plants and animals, environment
- Social studies: participate effectively in groups

Grade 5
- Communication Skills: listening, viewing, reading and vocabulary comprehension
- Science: interdependence of plants and animals, environment
- Social studies: participate effectively in groups

Location:
Schoolyard or outdoor location

Group Size:
25 - 30 students

Estimated Time:
30 minutes to get started and about ten minutes every few days to mix the pile. It will take 1-4 months to see results in the compost pile.

Appropriate Season:
Any

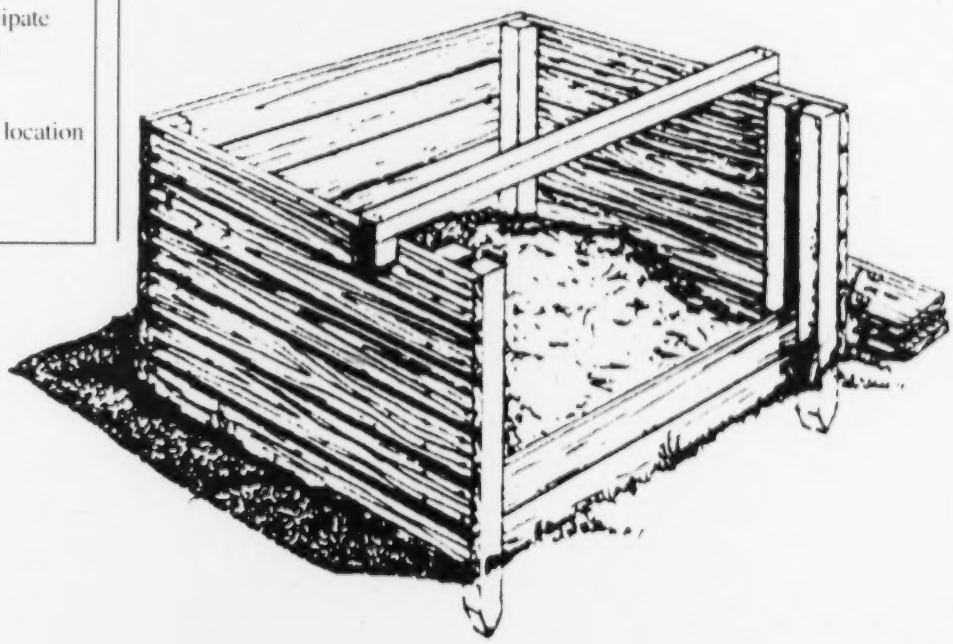
Materials:
Provided by the educator: A bin made of wooden timbers or any type of container that will allow air circulation, layers of dry materials (such as leaves, straw, grass and sawdust), layers of wet material (such as fruit and vegetable scraps, coffee grounds, and egg shells), water, shovel or pitchfork
Optional materials: 10-10-10 fertilizer (several cups), limestone (several cups)
Per student: Student's Information

Major Concepts:
- Decomposition
- Organic waste
- Compost
- Environmental stewardship

Objectives:
- Name two benefits of making a compost pile.
- Name the four elements of a compost pile.
- State how long a compost pile will take to start working.
- Explain how nature recycles.

Educator's Information:

In this activity the students will learn about the importance of composting and how decomposition happens, by creating and monitoring a compost pile.



Instructions:

1. Have the students read the Student's Information. Lead a discussion covering the following questions:

A. Why make a **compost** pile?

B. What do you put in a compost pile?

C. What things **decompose** the **organic** household and yard **waste** you put in a compost pile? (Bacteria, worms, other soil animals.)

D. What would happen if you put non-organic things in your compost pile? (i.e., plastic bags, aluminum cans, car batteries, tires, etc.). Would they decompose? (No.) What would happen to them? (They would be left after the organics had all become new **humus**.)

E. What elements are necessary for the **organisms** to thrive and decompose the compost materials? (Carbon nitrogen, air, water.)

F. Would the things you plan to put in your compost pile decompose if you put them in a **landfill** instead? (No, because landfills are generally sealed, so the proper elements are not there and therefore the organisms that break down the material cannot live there.)

G. What's the product of a compost pile? (Compost, humus.)

H. What are some reasons for composting? (Save landfill space; enrich garden soils.)

I. Is composting an example of **environmental stewardship**? Why or why not?

2. In preparation to creating a compost pile, get a container or enclosure which will help hold all the materials in the compost together. This container or enclosure may be a plastic drum or possibly a small, enclosed plot measuring no more than 4' x 4'. Whatever container is used, it is important to remember that air must be able to circulate in order for the organisms to break down the organic material. It is also important to layer the pile to enhance its productivity.

3. Begin the pile by having the students put down a layer three to four inches deep of branches, twigs and/or wood chips. These coarse plant materials will provide aeration and drainage.

4. The second layer should be heaped six to seven inches deep of leaves, grass and kitchen waste such as coffee grounds, vegetable peelings and egg shells. Do not use meat, bones, cheese, charcoal or coal ashes.

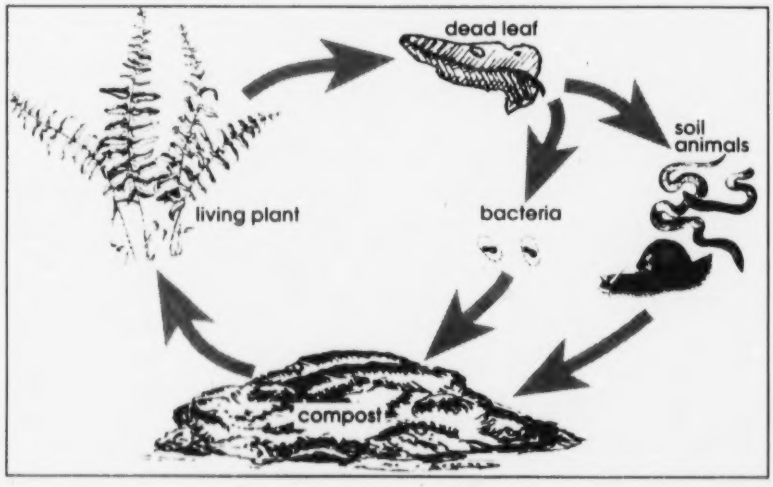
5. The third layer should be about six inches deep, consisting of hay, grass clippings or manure, to supply important nitrogen to the pile. (If none of these materials are available, it will take much longer for the composting to start. To give your pile a kick-start, you might sprinkle 10-10-10 fertilizer evenly over the pile.) You also might want to add some soil, to provide your new pile with soil organisms (helping speed the decomposition process along) or some lime (to aid in the decomposition).

6. Repeat the layering as many times as you want (a maximum height of three to four feet is recommended).

7. Have a student water the pile so it is wet, but not so wet that water drips out when you squeeze a handful of the material.

8. After the pile is set up, discuss with the students how composting works, how the plants and animals at Kerr Lake do this naturally (**recycling** nutrients), and why we, as good environmental stewards, should compost.

9. Have a student turn the pile with a shovel or pitchfork every few days. Depending on the weather conditions, your compost will be ready in one to four months. If you want to keep adding layers to your pile, it might take a little longer for your compost to be ready (closer to two to four months), but it will more accurately reflect how people compost at their homes and commercial businesses.



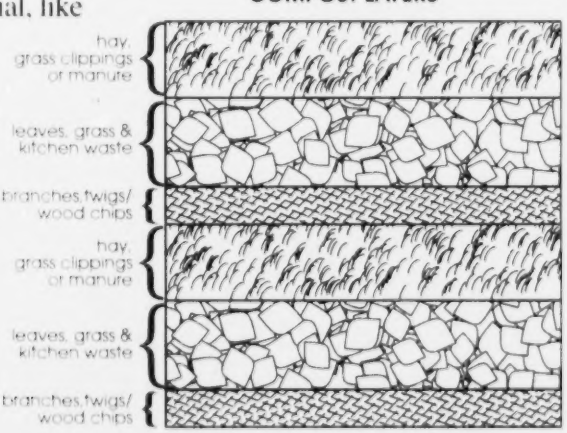
Student's Information

Composting occurs naturally almost everywhere. At Kerr Lake State Recreation Area, composting happens in a variety of ways, particularly when trees drop leaves or branches, and when grasses and flowers die back in the fall. All the dead plant parts rot and slowly **decay** away, creating compost. This compost is full of rich nutrients from the plants which enrich the soil. This soil then can grow more plants and the whole cycle starts over again. This type of composting has been naturally occurring for millions of years and is very beneficial to the earth. By composting all its natural products, the earth has no waste and it **recycles** the minerals and nutrients it has in short supply.

Humans, on the other hand, typically create huge amounts of waste which go to the **landfill** or garbage dump. Much of that waste could be composted, recycled or **reused**. In fact, 15 to 20 percent of all that waste is **organic** material, like grass clippings, food scraps, leaves, branches and wood chips. If that organic material were diverted to compost piles, not only would our landfills last longer, but our soil would be much richer and our plants healthier.

So what is a compost pile? A compost pile is where we can place all the organic materials we collect from our kitchen and yard and let nature do its thing—breaking down and rotting the materials to create a rich soil, called **humus**. To do the hard work of breaking down all the organic material, there must be live **organisms** in the compost pile. The most important of these is **bacteria**. In a healthy compost pile, the bacteria have help from fungi, snails, beetles, earthworms, springtails and other soil organisms. Between all these organisms, they eat, shred, digest and break down the organic material into humus. Humus is the nutrient-rich soil that remains after there is nothing left to decompose. It is crumbly, dry and dark brown or black in color.

COMPOST LAYERS


hay, grass clippings or manure
leaves, grass & kitchen waste
branches, twigs/ wood chips
hay, grass clippings or manure
leaves, grass & kitchen waste
branches, twigs/ wood chips

In order to survive and do the work of decomposition, these soil organisms must have four things in the compost pile: carbon, nitrogen, oxygen and moisture. Carbon provides food for the soil organisms. Things you can add to your compost pile that have a lot of carbon include leaves, straw, sawdust and cornstalks. The second element that is needed is nitrogen. Nitrogen provides protein to the soil organisms so they can digest the carbon. Manure, grass clippings and green vegetation are all excellent sources of nitrogen for a compost pile. Oxygen, the third element, is required by many kinds of soil organisms. Usually the ones requiring oxygen are the most efficient at decomposition. Oxygen is added to a compost pile by turning it frequently. Finally, moisture is necessary for the soil organisms. However, too much moisture can drown the soil organisms, so it is important to keep the compost pile moist, but not soaking wet.

Thus, a compost pile allows us to enrich our soil, gardens and flowerbeds with nutrient-rich humus. By composting, we decrease our use of landfills and, because the humus is nutrient-rich, decrease or even eliminate our use of chemical fertilizers.

On-Site Activity #1 — Trash Trek

Curriculum Objectives:

Grade 3
- Guidance: demonstrate responsible social skills
- Communication Skills: listening and viewing comprehension
- Science: interdependence of plants and animals, difference between living and non-living things, soil
- Social Studies: have a sense of time and chronology, participate in group activities

Grade 4
- Communication Skills: listening and viewing comprehension
- Science: interdependence of plants and animals, environment
- Social Studies: participate effectively in groups

Grade 5
- Guidance: competency for interacting with others
- Communication Skills: listening and viewing comprehension
- Science: interdependence of plants and animals, environment
- Social Studies: gather, organize and analyze information, participate effectively in groups

Location:
Soil and Water nature trail at Kerr Lake State Recreation Area

Group Size:
Class (25-30 students)

Estimated Time:
45 minutes - 1 hour

Appropriate Season:
Any (weather permitting)

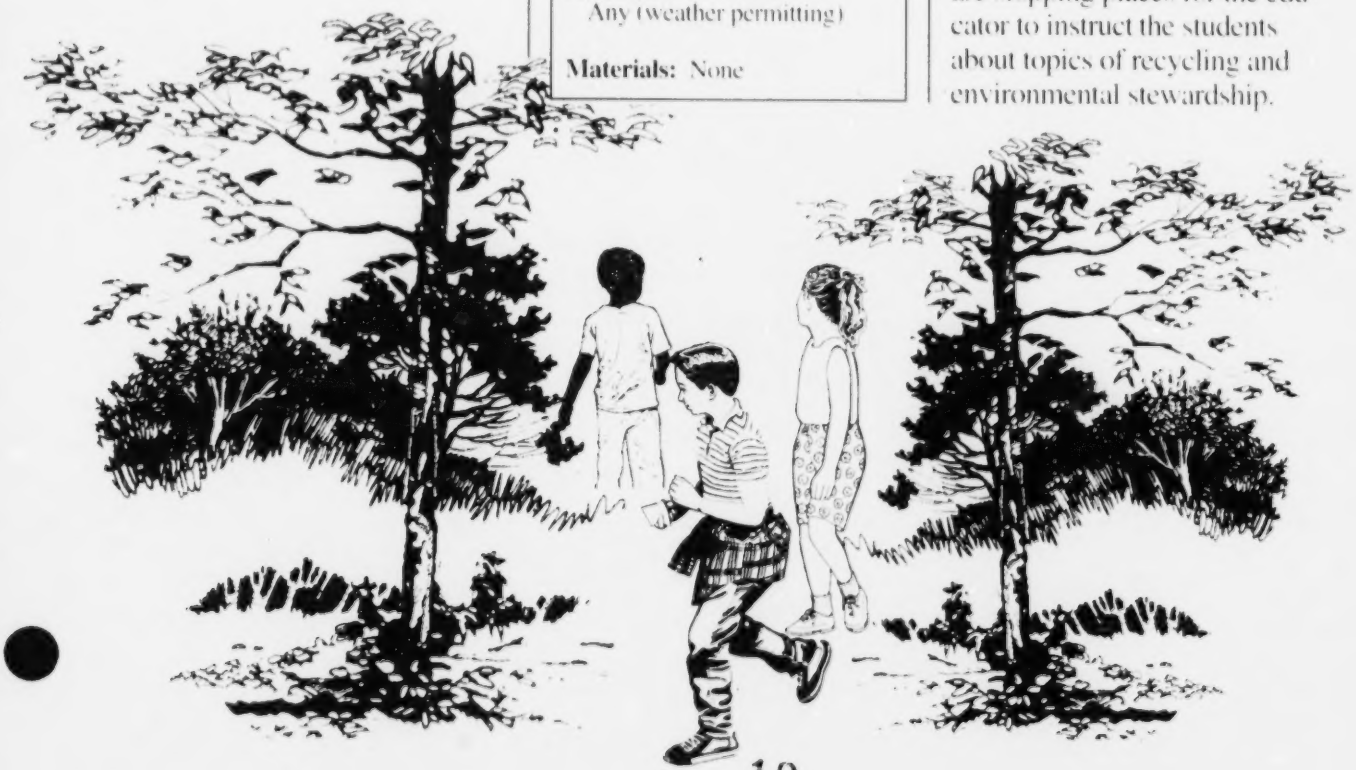
Materials: None

Major Concepts:
- Recycling
- Environmental stewardship
- Regeneration

Objectives:
- Identify two signs of forest regeneration.
- Recognize five items of human-made refuse and determine the if each can be recycled.
- List two agencies which work with forest regeneration projects.

Educator's Information:

The "Trash Trek" is a guided hike at Kerr Lake State Recreation Area that consists of five stations. The stations are stopping places for the educator to instruct the students about topics of recycling and environmental stewardship.



Instructions:

Prior to visiting the park, read the Student's Information to the students and discuss what they might see while visiting the area, in terms of nature (flora and fauna) and those things not indigenous to the natural setting (trash and litter). Have the students look for signs of rot and decomposition, as well as new and renewed plant life, as they walk along the trail. Have them also look for evidence of human presence, in the form of **trash** and **litter**. Ask the students to think of ideas on how to correctly **reuse**, **recycle** and dispose of trash they see. By witnessing the natural cycle of **regeneration** at work in the forest, the students will see that just as nature can reuse and recycle its own waste, people must work towards proper **environmental stewardship** by recycling and proper disposal of their refuse.

• Station #1 is the start of the "Trash Trek." At this station the students are welcomed and safety considerations are addressed. The safety concerns include staying with the group leader, not touching any of the plants on the trail unless otherwise instructed and wearing proper footwear. Pertinent North Carolina State Park System rules and regulations will be covered.

• Station #2 is a tree identification trail, on which forest regeneration is discussed. Forest regeneration is the process by which dying and **decaying** trees provide nutrients for saplings and seedlings to grow. The process is never ending, as the debris of the older trees provides soil for the younger trees, while birds and animals scatter seeds, allowing new plants and trees to grow. The educator will have students point out dead and rotting trees, and seedlings and saplings along the trail, to illustrate the process of forest regeneration. Trees can be identified by placards posted along the trail.

• Station #3 is an experimental forest plot, provided by the North Carolina Forest Service, in which many different species have been planted. This experimental plot helps illustrate the ways human can assist with forest regeneration. Many of these species would not grow in this region unless introduced by human planting. Generally, reforestation can occur more quickly with human intervention because there is less competition between the planted trees and the natural forest plants. The rate of forest regeneration can also be determined by the planting of slow-growing or fast-growing species. Some of the species at station #3 are white pine, Virginia pine, red pine, loblolly pine and bald cypress.

• Station #4 is located by the lake shore and the topic is trash and debris in the lake. Kerr Lake's water level fluctuates constantly and when the water recedes, it leaves trash and debris (such as branches, algae, leaves, etc.) behind. This debris can be detrimental to the plant and animal life, as well as unsightly and hazardous to humans.

• Station #5 is an open area maintained by the Vance County Soil and Water District. There, the students will see the effects of litter in a natural **environment**. The different items of litter demonstrate one of the negative effects people have on the environment by illustrating how unsightly litter is, compared to the natural features of the area.

Student's Information

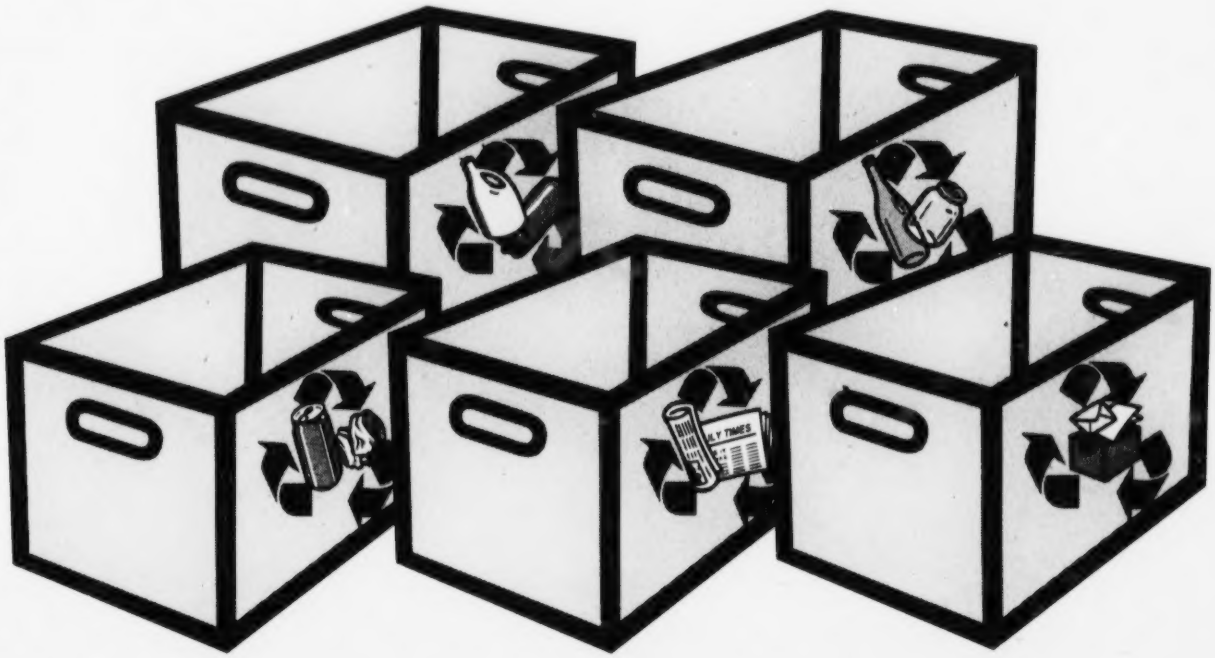
Think about the "Trash Trek" nature hike you are about to take. What do you expect to see? You will probably see trees, bushes and maybe small animals or a deer.

Think about **recycling** as your class plans its trip. Think about not only the recycling bins that your school or home may have, but also about the forest. That's right–the forest, because the forest is in a continual state of recycling and **regeneration**.

The forest recycling is not as difficult to see as it may seem. Imagine being in the forest. Can you see a tree that has fallen to the forest floor? Do you expect to see anything growing from that old tree? Imagine an area that was opened up by the old tree falling, and now you see small pines starting to grow. A new addition to the forest is being born before your eyes. As these young trees grow, using nutrients from the old tree, they add their part to the recycling cycle. When their leaves fall, these leaves do not just stay on the ground, but are broken down by living **organisms**. The living organisms break down **organic** material and turn it into a nutrient-rich soil called **humus**. These nutrients can then be taken up by the young trees again, or by other plants, and be recycled once more.

Also imagine, as you hike the trail, looking for **litter** or **trash** that may have been scattered by careless or insensitive hikers. What kind of litter do you expect to find? You may stumble across some soda cans, a plastic bottle and maybe some newspaper. All of these items can be recycled just like that dead tree we imagined early.

We can learn about recycling from nature as we make our "Trash Trek" through the forest.



On-Site Activity #2 — Recycling Relay

Curriculum Objectives:

Grade 3
- Communication Skills: listening and viewing comprehension
- Social Studies: identify and define problems and suggest ways to solve them, evaluate information, participate in group activities

Grade 4
- Communication Skills: listening, reading, vocabulary and viewing comprehension
- Guidance: competency for interacting with others
- Social Studies: gather, organize and evaluate information, participate in group activities

Grade 5
- Communication Skills: listening, reading, vocabulary and viewing comprehension
- Guidance: competency for interacting with others
- Healthful living: recreational safety
- Science: environment
- Social Studies: gather, organize and evaluate information, participate in group activities

Location:
Kerr Lake State Recreation Area

Group Size:
Class size (25-30 students)

Estimated Time: 30 minutes

Appropriate Season:
Any (weather permitting)

Materials:
Provided by the recreation area:
One box, four large grocery bags, "trash tokens" marked glass, plastic, aluminum and paper

Major Concepts:
- Recycling
- Recyclable trash
- Environmental stewardship

Objectives:
- Explain three ways recycling helps our natural world.
- Identify four types of commonly recyclable material.

Educator's Information:

The students will run a relay race to recycle four types of material. Prior to the park visit, have the students read the Student's Information.

Instructions:

This activity is a relay race, with the participants competing to determine who can "**recycle**" the quickest. The course for the relay will be set up with four large grocery bags placed side by side, facing a large playing field. Each bag will be labeled differently; one labeled "glass," one "plastic," one "paper" and one "aluminum." The four grocery bags represent the park recycling center and they will be the start and finish area for the relay. A box will be placed approximately 50 feet down the field from the "park recycling center." The box represents a park picnic area, and contains **trash** tokens.

1. Review the Student's Information with the students. Answer any questions they might have about recycling and explain the recycling relay.

2. Separate the students into two equal groups, with one being team A and the other, team B. Each team will have a team captain. The two team captains will stand on either side of the "park recycling center" and the rest of each team will line up behind their captains.

3. When the leader of the activity starts the relay, the first player in each line will run to the "park picnic area" and grab a trash token. The player will then run back to the "park recycling center" and place the token into the proper bag. The next player in line will then run down to the "park picnic area," grab another trash token and return to the "park recycling center," placing the token into the proper bag. This will continue until one team has completed the relay. The first team finished is the winner.

If any students had trouble figuring out how to recycle, reshuffle the teams and run the game a second time.

4. After running the game, gather the students and discuss the importance of recycling– how recycling can help all of us lead better lives with a decrease in ugly **litter** and trash, **conservation** of world resources, a decrease in energy needs and a reduction in **pollution**. Mention that by recycling, not only do we help ourselves, but we help the plants, animals, parks and natural areas. By recycling and wise use, we make the world a better place to live.

Extension:

If you wish to run the game at the classroom, examples of the trash tokens are provided in the activity packet. The trash tokens should be copied and then laminated. Cut the trash tokens apart. The number of trash tokens will depend upon the number of students; there should be one of each type of trash token for every four students. The number of trash tokens for a class size of 20 students would then be five of paper, five of plastic, five of aluminum and five of glass. Set up the course for the activity as described in the Instructions, and have fun!

Student's Information

What do you do with all your **trash** when you go camping or picnicking at Kerr Lake State Recreation Area? The majority of the general public just throws it in garbage cans, but as of the spring of 1992, Kerr Lake State Recreation Area established **recycling** bins to collect recyclable material.

Take a good look at your own picnic trash. You may find a newspaper, some plastic wrap, soda cans, a glass jar and maybe a milk jug. These items are all worthless trash, things you no longer need, right? They are no longer a problem for you after you leave the park, right? Trash is a big problem in today's "throw away" society. Unless you sort your trash and place what can be recycled into the recycling bins, that bag of trash is headed to a **landfill** to be buried, or to an **incinerator** to be burned. Today, many of our landfills are almost filled to capacity, and incinerators can emit pollutants, many of which are toxic to our environment.

What can we do about this trash problem? We can start **precycling**–by not buying things we really don't need, not buying things with a lot of packaging and not buying things we cannot easily repair or get fixed. We can also recycle. To recycle, we have to separate the recyclable trash from the non-recyclable trash. The four common types of recyclable material are paper, aluminum, plastic and glass.

Recycling can save more than just landfill space. The average American uses about 120 lbs. of newspaper annually, according to the American Paper Institute. We can save approximately 25 million trees if everyone recycled even 1/10 of their newspapers.

Aluminum soda cans can be recycled into new aluminum products. Americans recycled 42.5 billion aluminum cans in 1988, according to the Aluminum Association. The energy saved by recycling just one aluminum can could operate a TV set for three hours. Recycling aluminum also cuts related air pollution by 95%, according to The Earthworks Group.

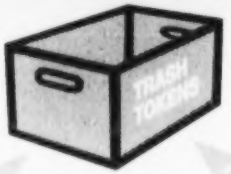
Plastic can also be recycled. A six-foot park bench can be constructed from the recycled plastic of 1,050 milk jugs. Plastic soda bottles are a form of polyester and can be recycled in several forms. Recycled plastic bottles can be found in approximately 1/3 of all the carpeting in the United States and a ski jacket can be stuffed with fiberfill generated from just five 2-liter plastic soda bottles. It is very important to recycle plastic. Plastic will not "break down" naturally and so we will have plastic to worry about virtually forever if we do not recycle it.

Glass can also be recycled; in fact, using recycled glass can cut the energy to make new glass by 25-32%. Household trash is about 2.5% glass and every two weeks enough glass is thrown away by Americans to fill the 1,350-foot towers of the World Trade Center.

The next time you take the garbage out, think about what you are throwing away. Is it really all worthless trash? Household trash is not necessarily all worthless.

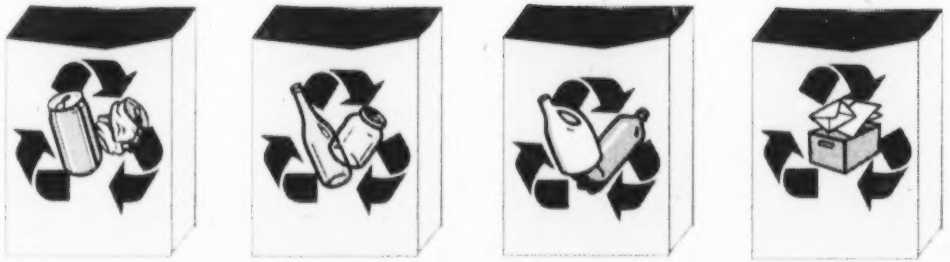
Recycling can benefit the environment by saving energy required for the manufacturing of household products and converting raw materials to finished products. By recycling, we can save in other ways as well. Recycling will save valuable landfill space. It will also save raw materials, many of which are non-renewable. The race is on to recycle, because we may not always have the raw materials to turn into garbage and, even if we do find the raw materials, we may not always have any place to put the garbage.

Trash Relay



Team A

Team B



Park Recycling Center

Kerr Lake State Recreation Area, NC 424 May 1994

Trash Tokens

SODA CAN	MILK JUG
ALUMINUM CAN	PLASTIC SODA
JUICE CAN	MILK JUG
SODA CAN	PLASTIC BOTTLE
JUICE CAN	PLASTIC SODA

Trash Tokens

Post-Visit Activity #1 — Don't Throw It All Away

Curriculum Objectives:

Grade 3
- Guidance: demonstrate responsible social skills
- Science: matter
- Social Science: identify and define problems and suggest ways of solving them, locate and gather information, participate in group activities

Grade 4
- Guidance: competency for interacting with others.
- Social Science: gather, organize and analyze information, participate effectively in groups

Grade 5
- Guidance: competency for interacting with others.
- Science: environment
- Social Science: gather, organize and analyze information, participate effectively in groups

Location: School

Group Size: Class size

Estimated Time:
30 minutes - 1 hour weekly

Appropriate Season: Any

Materials:
Provided by the educator: signs, materials to make handouts (pens, paper, crayons and any other items necessary), barrels/bins

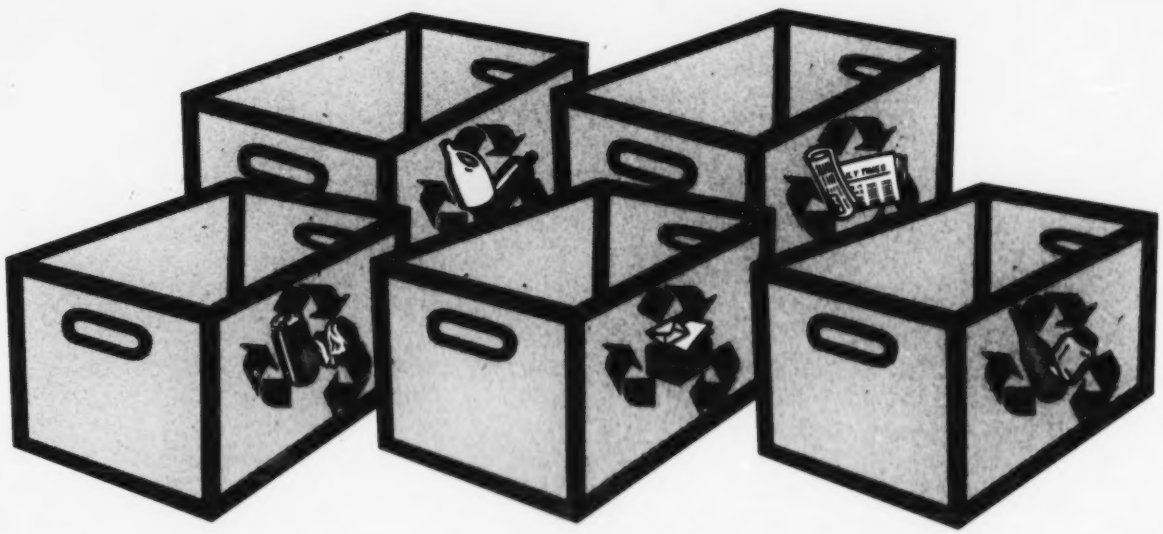
Recycling Center

Major Concepts:
- Recycling
- Recycled products
- Environmental stewardship

Objectives:
- Promote recycling of at least three different types of recyclable items.
- Name four items of trash that can be recycled, and name at least one product each one might be turned into when recycled.
- Explain three reasons why recycling is important.

Educator's Information:

In this activity the students will develop a recycling station at their school; promote its use and availability; and determine how much is saved in resources, landfill space or energy, by recycling.



Instructions:

It is important to know what items can be most easily **recycled** in your area. Consequently one of the first things you will need to do is locate a recycling facility close to the school and find out what materials they will accept. As these may vary from place to place, you might want to start with aluminum cans (almost all recycling facilities accept them) and proceed from there.

Once you have decided what materials you will collect, have the class create public address announcements, handouts and posters to make others aware of their plans. Be sure the announcements cover the importance of recycling and being good earth stewards. You might also emphasize that nature recycles naturally and we're only following nature's example.

Bins or barrels will be needed to store the recyclables at the school. Label them for each material to be collected. On rotation, assign one or two students to oversee the collection site at the school. Coordinate with the recycling facility, the students' parents or the PTA for delivery to the recycling facility.

After the recycling program is established, have the students weigh all the materials collected for one week. Be sure to weigh aluminum, glass, plastic and papers separately. Multiply each of the total weekly weights by 52, to get an estimate of how much the program will recycle in a year. Have the students calculate how many trees and how much energy has been conserved through their recycling program.

Local Recyclers:

Allen Recycling Center
PO Box 2106 (Industry Dr.)
Henderson, NC 27536
Tel: (919) 492-7836
Mon. - Fri.
Non-magnetic metals (aluminum, brass, copper, auto radiators).

Rocky Mount Recyclers
232 Halifax Rd.
Rocky Mount, NC 27801
Tel: 1-800-346-2445
Mon. - Fri.
Scrap iron and metal, aluminum, brass, copper, brown and clear glass containers.

Ball-Incon
PO Box 887 (Hwy 1 Bypass)
Henderson, NC 27536
Tel: (919) 492-1131
Thus. 10:00 am - noon
Brown, clear and green glass containers.

Sun Shares
1215 Briggs Ave. #100
Durham, NC 27703
Tel (919) 596-1870

Bins accessible 7 days a week, locations throughout Durham County. Aluminum; bi-metal and steel (tin) cans; brown, green and clear glass containers; newspaper; plastic milk jugs; clear and green plastic soda bottles.

Vance County Solid Waste Department
300 S. Garrett St.
Henderson, NC 27536
Tel: (919) 596-1870
There is a manned collection site at the Vance County landfill two miles north of Henderson on NC 39. Aluminum; brown, green and clear glass containers; newspaper; plastic milk jugs; clear and green plastic soda bottles.

For additional information, contact:

N.C. Department of Environmental Health and Natural Resources
Solid Waste Section
PO Box 27687
Raleigh, NC 278611-7687
Tel: (919) 733-0692

North Carolina Recycling Association
PO Box 25368
Raleigh, NC 27611-5368
Tel: (919) 782-8933

Student's Information

Do you and your friends want to get involved in helping to protect our **environment** and save our resources? Earlier, we learned the importance of **recycling**; how it not only helps the landfills, but helps preserve resources by making new items from old ones, using less of the world's non-renewable resources and saving energy. You can help protect the environment by starting a recycling program with your class at school. You will not only help your schoolmates understand more about recycling, but might possibly increase community involvement with your school through your recycling project. Newspapers, glass bottles and jars, aluminum cans and plastic soda bottles are some of the more common items that you can collect for recycling.

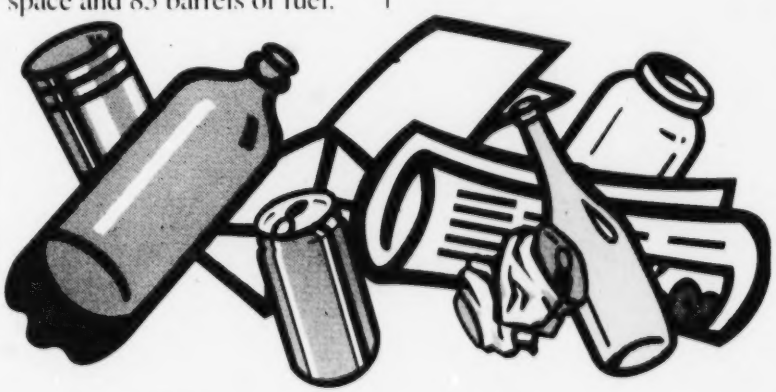
Newspapers make up about 6.5% of our trash and are readily accepted at local recycling centers. Old newspapers can be recycled into packing material, building materials and new newspapers. Recycling one ton (2,000 lbs) of newspapers will save 17 trees from being cut. That same ton of newspapers will save two barrels of oil, (there are 55 gallons of fuel to a barrel) which would have been used to fuel the production of "new" paper. It also saves three cubic yards of **landfill** space.

Glass bottles and jars make up about 2.5% of household trash and are accepted at local recycling centers. The products that can be made from recycled glass include new glass, road building materials and fiberglass components. The energy saved by recycling just one glass bottle could be used to light a 100 watt light bulb for four hours or run a television for three hours. Recycling one ton of glass will conserve nine gallons of fuel and four cubic yards of landfill space.

Aluminum cans make up 2.7% of the waste stream and are probably the most commonly recycled item. Aluminum can be recycled into new aluminum products such as soda cans, aluminum foil, cooking pots and airplane parts. Recycling just one aluminum can saves enough energy to light a 100 watt light bulb for 3 1/2 hours. That one can would save 1/2 cup of gasoline. Recycling one ton of aluminum cans saves 27 cubic yards of landfill space and 85 barrels of fuel.

Plastic soda bottles make up about 4.7% of the waste stream. There are currently fewer uses for recycled plastic, but it is slowly being recycled in many areas. Polyester fibers for carpets and other textile industries, fill for jackets and pillows, construction materials and drainage pipes are some of the items that use recycled plastic. A six-foot park bench can be constructed from the recycled plastic of 1050 milk jugs. Recycled plastic bottles can be found in approximately 1/3 of all the carpeting in the United States and a ski jacket can be stuffed with fiberfill generated from just five 2-liter plastic soda bottles.

There are many good reasons for recycling. They include saving landfill space, making new items from old ones, **conservation** of the world's non-renewable resources and saving energy. As you can see, starting a recycling program can benefit more than the environment. So don't blow it, don't throw it away.



VOCABULARY

Bacteria - One or more unicellular microorganisms in the class Schizomycetes, such as free-living organisms or parasites.

Biodegradable - Any item that can decompose naturally.

Compost - Decayed organic material; it forms rich nutrients to be used as a natural fertilizer.

Conservation - The use of natural resources in a way that assures their continued availability to future generations; the wise and intelligent use or protection of natural resources.

Decay - The gradual breaking down of a substance; to rot.

Decompose - To break down materials into smaller more basic components.

Degrade - The process of eroding or wearing down; to decompose.

Environment - The area around all living things and the conditions and circumstances that affect them.

Environmental stewardship - The wise use and responsible care of our environment, expressed through specific lifestyle practices and principles such as precycling, recycling, conservation, preservation and any other activity that reduces pollution and the degrading of the environment.

Humus - A crumbly, dry material made from decomposed plant materials, that is dark brown or black in color. It can be added to soil to enrich it and provide nutrients for plants.

Incinerator - A facility where waste and trash are burned.

Landfill - A place where waste and trash are buried.

Litter - The scattering of discarded materials in an untidy manner.

Organic - A material consisting of, or originating from, living organisms.

Organism - A plant or animal.

Pollution - A human-caused change in the physical, chemical or biological conditions of the environment that causes an undesirable effect on living things.

Precycle - To conserve resources by buying items with little or no packing material to prevent the generation of unnecessary trash, and of using long-lasting, durable items that can be effectively reused, reducing discards.

Preservation - The act of maintaining and protecting a natural area for plants and animals.

Recycle - To reuse the useful materials in waste to make new materials, such as reusing the aluminum in a used aluminum can to make a new aluminum can.

Regeneration - The act of something new growing to replace something old, such as a new tree growing in the place of a tree that has fallen down.

Reuse - To use an item more than once.

Trash - A discarded item that is no longer wanted or needed.

References

Burgess, Carla B. (ed.). 1990. *Ripples: A Big Sweep Elementary Activity Guide.* University of North Carolina Sea Grant Publication, UNC-SG-90-02. For more information, contact University of North Carolina Sea Grant College, Box 8605, North Carolina State University, Raleigh, NC 27695.

Composting - A Natural Experience Poster. PUBL-IE-038 90. Courtesy of Wisconsin Dept. of Natural Resources, PO Box 7921, Madison, WI 53707.

Earley, Lawrence S. 1990. "The Rush to Recycle." *Wildlife in North Carolina,* April, Vol. 54, No. 4. For more information, contact North Carolina Wildlife Resources Commission, 512 N. Salisbury St., Raleigh, NC 27604-1188.

The Earthworks Group. 1990. *50 Simple Things Kids Can Do to Save the Earth.* Berkeley, CA: Earthworks Press.

The Earthworks Group. 1989. *50 Simple Things You Can Do to Save the Earth.* Berkeley, CA: Earthworks Press.

The Earthworks Group. 1991. *The Next Step: 50 More Things You Can Do to Save the Earth.* Berkeley, CA: Earthworks Press.

The Earthworks Group. 1990. *The Recycling Handbook.* Berkeley, CA: Earthworks Press.

Gore, Albert Jr. 1992. *Earth In the Balance.* New York, NY: Houghton, Mifflin and Co.

Life from Death. . .Recycling Poster. PUBL-IE-037 90. Courtesy of Wisconsin Dept. of Natural Resources, PO Box 7921, Madison, WI 53707.

MacEachern, Diane. 1990. *Save Our Planet.* New York: Dell Publishing Co.

National Wildlife Federation. 1990. "Pollution: Problems and Solutions." *Ranger Rick's Nature Scope.* For more information, contact National Wildlife Federation, 1400 16th St. NW, Washington, DC 20036.

Recycling Wheel. 1990. For more information, contact Environmental Hazards Management Institute, 10 Newmarket Rd., Durham, NH 03824.

Sun Shares. *Composting.* For more information, contact Sun Shares, 1215 S. Briggs Ave., Suite 100, Durham, NC 27003.

SCHEDULING WORKSHEET

For office use only:
Date request received_____ Request received by_____

1) Name of group (school) _____

2) Contact person _____ _____
name phone (work) (home)

_____
address

3) Day/date/time of requested program _____

4) Program desired and program length _____

5) Meeting place _____

6) Time of arrival at park _____ Time of departure from park _____

7) Number of students _____ Age range (grade) _____
(Note: A maximum of 30 participants is recommended.)

8) Number of chaperones _____
(Note: One adult for every 10 students is recommended.)

9) Areas of special emphasis _____

10) Special considerations of group (e.g. allergies, health concerns, physical limitations)_____
_____

11) Have you or your group participated in park programs before? If yes, please indicate previous programs attended: _____
_____

12) Are parental permission forms required? _____ If yes, please use the Parental Permission form on page 8.2.

I, _____, have read the entire Environmental Education Learning Experience and understand and agree to all the conditions within it.

Return to: Kerr Lake State Recreation Area
Route 3, Box 800
Henderson, NC 27536

Fax: (919) 438-7582

PARENTAL PERMISSION FORM

Dear Parent:

Your child will soon be involved in an exciting learning adventure - an environmental education experience at **Kerr Lake State Recreation Area**. Studies have shown that such "hands-on" learning programs improve children's attitudes and performance in a broad range of school subjects.

In order to make your child's visit to "nature's classroom" as safe as possible we ask that you provide the following information and sign at the bottom. Please note that insects, poison ivy and other potential risks are a natural part of any outdoor setting. We advise that children bring appropriate clothing (long pants, rain gear, sturdy shoes) for their planned activities.

Child's name _____

Does your child:

- Have an allergy to bee stings or insect bites? _____
  If so, please have them bring their medication and stress that they, or the group leader, be able to administer it.
- Have other allergies? _____
- Have any other health problems we should be aware of? _____
- In case of an emergency, I give permission for my child to be treated by the attending physician. I understand that I would be notified as soon as possible.

_____ _____
Parent's signature date

Parent's name _____ Home phone _____
(please print) Work phone _____

Family Physician's name _____ phone _____

Alternate Emergency Contact

Name _____ phone _____

NORTH CAROLINA PARKS & RECREATION
PROGRAM EVALUATION

Please take a few moments to evaluate the program(s) you received. This will help us improve our service to you in the future.

1. Program title(s) _____ Date _____

   Program leader(s) _____

2. What part of the program(s) did you find the most interesting and useful? _____

3. What part(s) did you find the least interesting and useful? _____

4. What can we do to improve the program(s)? _____

5. General comments _____

LEADERS OF SCHOOL GROUPS AND OTHER ORGANIZED YOUTH GROUPS PLEASE ANSWER THESE ADDITIONAL QUESTIONS:

6. Group (school) name _____

7. Did the program(s) meet the stated objectives or curriculum needs? _____

   If not, why? _____

Please return the completed form to park staff. Thank you.

Kerr Lake State Recreation Area
Route 3, Box 800
Henderson, NC 27536
Fax: (919) 438-7582